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GUNS OF THE JAMESTOWN FLEET

By Cary S. Tucker

This spring it is intended to exhibit the replicas of the three Jamestown ships; the SUSAN CONSTANT, the GODSPEED, and the DISCOVERY, in connection with the 350th Anniversary of the landing of the first successful English colonists in America. As to the ships and their construction, Mr. James Fee (N.R.G.) may be heard from later. In general they follow, I believe, the painting made by the late Griffith Bailey Coale for the Virginia State Capitol, though there were doubtless a number of adjustments to be made in translating a painting into three, three-dimensional, full-sized ships.

Photographs by Flournoy, Courtesy of the Virginia Chamber of Commerce

Frontpiece - SUSAN CONSTANT on a trial run

Page 64 - Guns and carriages of the Jamestown Fleet.

The ship's furniture (including the guns) was under the direction of Mr. King Meehan, then Director, Special Projects, and now General Manager. Mr. Meehan, after doing research at the Mariner's Museum, was prompted by John Lochhead to get in touch with me because of my own work there two years earlier; and several months later after much 'volunteer' work (and a rather voluminous correspondence) I was engaged as Consultant to the Commission on guns, carriages and gun furniture. Faced with budgetary limitations Mr. Meehan had decided to use one design of guns only for the main armament of the ships- that of "falcons" and the design of these pieces was taken from a drawing received from England.

As the ships took form, however, it was discovered that the port heights of the SUSAN varied not only on each deck, but also for the two ports on the lower (main) deck. Port heights were given me as follows:

Spar deck, from deck to sill	1' - 5"
Spar deck, from deck to top of port	2' - 10"
Main deck, aft ports, deck to sill	1" - 11"
Main deck, aft ports to port top	3' - 5"
Main deck, forward ports, deck to sill	0' - 5"
Main deck, forward ports, deck to top sill	2' - 4"

A falcon, or any of the usual guns, would look rather ridiculous on a conventional carriage low enough to fit these forward ports, so that the first step in gun design was taken. The only pieces which could fit and still be authentic were the larger breech-loaders on "wheeled log" carriages somewhat similar to those which were used aboard the MARY ROSE when she sank in 1545. Since it was not until 1603 that the vessels of the Royal Navy had been equipped with the new bronze muzzle-loaders for their main batteries it would not be at all out of character for a merchantman to be carrying guns of the older style, though this will be discussed more fully later.

Some time later as the design of the GODSPEED developed it was found that her ports, too, would be very low; 8" from deck to sill, and 19-1/2" from deck to top of the port. Now for over a year Edwin N. Rich and I had been exchanging ideas on guns and, of course, I had told him what I had done on the SUSAN'S big guns. Through one of those fortunate coincidences which sometimes come along, he had lent me his copy of the Danish "Vaaben Historiske Aarboger, IIIb, 1941" just at the time when I received the information as to the GODSPEED. This book gives an account of the "Second Anholt Find of 1937", a wrecked small ship dated ca. 1560 to 1575. Since she carried guns and ordnance material both on deck and as cargo, on a voyage from England to Denmark she should give a fair comparison with the ships of the Jamestown fleet which were of only a few years later and were also in the same class as chartered merchantmen or small government transports. The guns on this unknown ship which were above deck were all breech-loading, and of 3" bore or larger; for there were several different sizes and four main types of mounting. As a concession to the probable increase in efficiency through the passage of years several changes were made in the design as compared with the 'reconstruction' of the carriage by Mr. Neilson and with the recovered guns and stocks. The trucks (or wheels) were made smaller to fit the installation, the stocks were to be made straight-sided, and they were given a sharper slope underneath so that the guns could be elevated by being brought nearer the port at the moment of firing. A single type and size were planned for the four guns, as making for both budgetary gains (now) and for the use of a single size of shot as being a better scheme of armament then.

Both of the two breech-loading types above were to represent the iron pieces which were (in the manner of a wooden barrel) of a number of wrought iron 'staves' assembled over a mandrel, welded by a blacksmith as well as possible and held in place by iron rings shrunken on. Parenthetically it should be noted that these

rings were the origin of the numerous moldings carried by the later cast guns up to- and past- the middle of the 19th Century. These guns though they corroded badly (when swabbed with salt water) and consequently leaked powder gas if made of a single layer of 'staves', were light in weight for the size of the ball they threw and could be fired a good deal more rapidly than the muzzle loaders as the extra chamber provided made for easier re-loading. For these reasons the breech-loading principle continued in use for many years more for big guns of low velocity; six such pieces were made in Denmark as late as 1664, though they were never used. For swivel guns breech-loaders were in use even longer; the wreck of a Dutch ship in 1727 on the coast of Australia offers a case of actual use, for a 4 pdr. breech-loading swivel was later found on the site, while Texier de Norbec shows a Spanish design for a similar piece of 1783, approximately. These factors, plus the idea that it is logical to expect these vessels to be equipped with the "war surplus" guns released by the Royal Navy are, I believe, a sufficient explanation of the use of breech-loaders. It might be interesting, however, to add that the ordnance inventory of the English Navy for 1603 included 2 heavy "curtalls", 29 "portpeices" and 78 "fowlers", each with two chambers (and therefore breech-loaders), with the other weapons aboard the 42 ships.

When considering the swivels it should be noted that there were at least three different methods of making them and three different materials; brass (or bronze), cast iron, or wrought iron. They were made either in one piece; in two pieces (each of one piece) or with a built-up barrel joined to a one-piece receiver (or "hall", as it was then called). If made of two pieces either of the parts could be of either of the three materials, though the built-up barrels were usually of wrought iron, and the chambers of cast iron. The chambers, of 'beer mug' shape, were held in positionby either an iron key horizontally through the piece or by a large wedge (of wood or metal) at the rear of the chamber. The guns as designed are of cast iron in one piece, but with a bow to tradition in the large muzzle ring, and provide for both methods of locking as the receiver is open at the bottom. Another reason for this construction is that in this way rain can drain from the receiver; if that reason might not have appealed to these who originally armed the ships, the dual locking idea may have, on the basis that the guns could not be put out of action by loss of the iron keys. Some surviving pieces of this type do have the dual locking feature, though they are difficult to date exactly.

In considering these ships and their armament it may be well to remember that all definite knowledge of the vessels has disappeared with the records of the "Virginia Company" sent to England in 1623. Their time of building is now unknown, and they - or some of the three - may have been ten to twenty years old at the time of the voyage to Jamestown. They may have carried their original armament; may have been armed especially for the voyage; or may have mounted some of their original guns and some of these destined for the Jamestown fort, carried as cargo during the voyage.

The circumstances affecting the designs have been related in some detail as the variation in port heights which caused so much extra work has actually done much to increase the authenticity of the armament. It is not improbable that the original armament was selected through much the same process, or at least for much the same reasons which were followed in the replicas! Perhaps an exception might be taken to the use of 'falcons' on the main deck, as 'minions' or 'demi-culverins' could have been used there except for the attempt to standardize for budgetary reasons - though that circumstance applied in those days quite as well as today.

I have had to fit this work into a heavy schedule of other activities and Mr. Meehan is due my thanks for his understanding of the rather odd working periods resulting. Additionally, thanks for the ideas and support are due to Ed Rich, John

Lochhead, Jim Harbin and many others who helped, directly or indirectly, in this work which I have thoroughly enjoyed. I hope that the ships and the guns, which are being made as I write this, will be interesting to those who come to Jamestown Festival this year, and will contribute to discussion - and further research - among the members of the Nautical Research Guild as well as historians everywhere.

As noted on the drawing all rights to the commercial reproduction of these guns are held by the Virginia 350th Anniversary Commission.

Possibly it is worthwhile to add a few words concerning a perhaps arguable item of gun equipment. This particular point was whether or not the guns had breechings, or ropes to limit the recoil, because of a remark by Mainwaring in 1625 that; "Breechings were not used in a fight but to secure the guns at sea, particularly in a storm". Apparently this rather widely known remark has stopped all research on the subject in England as repeated correspondence could develop nothing further. In fact, Prof. Louis H. Bolander, of the U.S.Naval Academy Library in checking at my request, found one English author who enlarged on the difficulties of the gunners of this time by concluding that "The recoil of the guns was unpredictable, varying by several feet as there was no means of limiting the recoil".

Actually the means existed, since all ships carried breeching ropes, and I believe the matter to be one of nomenclature rather than whether a recoil-limiting-rope was actually fitted. The recoil of any gun can be figured on the basis of the weight of the gun against the weight of the shot and its velocity at the muzzle of the gun. This recoil was by no means negligible, for Dupin gives the recoil of a long 24 pdr. (in 1819) as 11 feet, when firing from a level platform, and the ratio of gun weight to shot weight was comparable to the ratio existing in 1607 - probably a good bit better. In firing to windward, the ship being on a wind with perhaps a ten degree list, it would be a 'bold soul' indeed who would fire a heavy gun with the then-established charge of powder of the same weight as the ball, without some means of stopping the recoil of the gun short of the lee bulwarks! As alternatives to a recoil-limiting-rope there might be suggested wedges or other obstructions on the deck in the way of the trucks of the carriages, or perhaps 'snubbing' or belaying the side tackles. Either measure is (to my mind) doubtful, because of the time required and the risks of failure, especially when the breeching (already on board) could be carried around the carriage and give real results. The rope so rigged could have been referred to as the 'preventer' we might say, whereas when rigged to the breech of the gun- when they were housed - it would take the name of 'breeching'. My theory is that the recoil-limiting-rope became the breeching in fact around 1650, when the guns were housed; the 'preventer' name no longer having any application.

Therefore it was decided to fit the pieces with 'preventers' across the center 'steps' of the more modern carriages and around the rear of the wooden stocks of the breechloading broadside guns. The largest guns to have two eyes in their preventers so that they would be held near the side of the ship when not in action and with the port lids closed, or, with the inner eyes engaged in hooks in the ships side the shortened preventer would keep the muzzle protruding from the port even when in full recoil. The GODSPEED guns, being on the open deck, would not have to be housed and the ropes (whatever they might be called!) should be short enough so that the forward end of the stock would rest on the port sill when at the full rear (or recoil) position.

The carriages for the falcons are taken from the oldest marine or naval carriages of the type that I can discover; they were recovered with their wooden parts intact (and parts of the iron fittings) from the ENIGHEDEN, a Dutch warship which went to the bottom in 1679. Salvaged in 1909, they were restored by the replacement of the wrought-iron strapping in 1935. They thus also have the virtue of not having multiple 'restorations'over the years. The simplicity of the capsquares (simple hinges) seems especially appropriate for the date (or for 1607!) and though

"advance hooks" have been added, as they seem to have been used by the Royal Navy in the early 17th Century, the carriages are otherwise quite close copies of the ENIGHDEN ones. The side strapping was required in those days because of the need of strength, to tie the wooden parts together; the throughnolting used later apparently was not practicable then because of the difficulty of boring long straight holes and the absence of screw-cutting machinery. Note that the 'bolts' used in this carriage were secured with wedges, rather like cotter pins.

The higher carriages are straight-sided fore and aft to simplify manufacture, and because the spread aft is not needed due to the width given them to prevent overturning. While this width is about 2 degrees more than that used on the lower ones the extra heighth made them appear unstable if given less 'beam'.

Since I have never seen the plans of the ships, the figure of 1; 24 was taken as the camber, or slope, of the deck near the sides where the guns would be mounted and the carriages figured for 10 degrees elevation and 4 degrees depression, which is permitted by the ports; this is the reason why the centerline of the gun is below the center of the ports, as elevation was more important than depression in all cases and especially so for such small ships.

The big breech-loaders apparently had no method provided for varying the elevation; though no doubt wedge-shaped pieces of planking were used under the trucks occasionally, their primary use was to batter the hull of the enemy ship, so that little variation in height of aim would be needed in any case. The drawings show these guns as prepared to fire, with chambers in place and 'secured' by wedges. In actual fact it seems that the chambers literally 'jumped the gun" (or rather, jumped from the guns) and as a concession to safety (or 'modernization') the eyebolts at the sides of the chambers have been added, so that rope lashings could have been used. The GODSPEED guns could have a rope lashing passed around the stock. The chambers were made with a short 'neck' which fitted into the rear of the bore, but even this and the wedges were apparently not always enough to keep them in place. Shot for these guns was usually rope-wound, both to keep them from rolling forward in the gun and to reduce the windage - or space between the shot and the bore. Loading procedure was to place the shot in the bore just ahead of the place where the lip or neck of the chamber was to go and to then place the chamber in the gun and replace the wedges. The extra chamber was filled with powder and a wooden plug was driven into the chamber, so as to have as little air space as possible. With trained crews reloading was faster, by a good deal, than with the muzzle loader.

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The following excerpt was taken from a letter to the secretary after the article had been submitted by the author:

"On my visit to Jamestown only one of the ships ("GODSPEED") was there so I didn't see most of "my" guns. As it worked out (I had never seen the ship plans). The mounting of the "GODSPEED'S" pieces was about the only one that could have been used as there is a wide hatch in back of the ports. There would have been no room to load a muzzle leader inboard or for it to recoil even. By the way, the guide told a friend of mine that the guns were original pieces!

The Archives didn't have too much that I could use but there is a lot of potential useful stuff there but it has to be connected up. Have run into an occassional blooper in the "traditional" markings or attributions as you may remember. Ed Rich, too, was shown a gun at Winchester, Va. which came over on the Mayflower. It's certainly corroded enough to have, but probably dates from around 1710 or so and must have been of poor iron or else spent a long time buried."

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The Guns of the Jamestown Ships 1607-1957

Designed For The Virginia 350th Anniversary Commission
Carey S. Tucker 1956

Falcons ~ After English Brass Gun of the period

2½" Bore

Section at Trunnions

Swivels ~ Cast Iron ~ All Ships, Brec'd

1½" Bore

Key

Rear View | Sec. 'A-A' | Sec. 'B-B' | Sec. at trunnion | Chamber (2) Per Gun

Swivel Fork, Fixed on Gun

Carriages ~ Upper Deck Guns ~ SUSAN CONSTANT (4)

Quoins, Each 6" Wide

One-Half Plan View

Stool for Quoins

Front | Rear

Carriages ~ Aft Lower Deck Guns ~ SUSAN CONSTANT (2)

Note: Carriage Straight-Sided; Quoins Same As Shown; Stool 9"W. x 12⅝"H x 12⅝"L.

Front | Rear

Forward Lower Deck Guns SUSAN CONSTANT (2).

Extra Chamber For Each Gun.

Half Front View

5" bore

(Inlet Brace)

GODSPEED's Main Battery ~ 4 Guns (& Extra Chambers)

3" Bore

Front View

TUCKER dec. '57

Scale ~ All Drawings ~ 1½" = 1'-0"

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NAUTICAL RESEARCH JOURNAL

Part II

NOTES UPON THE LUGGER RIG

by

D. L. Dennis

Running Rigging:

The bowsprit had a traveller which carried a loose hook and a shackle whose legs embraced the traveller on each side of the hook. This last was hooked to the tack cringle of the jib. The jib outhaul was spliced around a thimble on the shackle, lead down through a sheave in the bowsprit near its outer end and then (when not used as a bobstay) lead inboard. The inhaul was sometimes spliced around a thimble on a bridle, the eyes in the ends of the latter being seized to the port and starboard sides of the traveller. According to Nogues the jib tie lead through a sheave hole (clan) at the masthead on the port side (a cheek-block?), it had a two fold tackle on its lower end and a thimble on its forward end which was placed over the hook on the traveller to do duty as a stay when the jib was not set. He does not say how this thimble was bent to the peak of the sail - a hook would appear to have been more in order than a thimble. A more usual (perhaps later) arrangement, I think was the following: The standing part of the halyards was lead forward through a leading block strapped to an eyebolt in the deck on one side of the mast, forward through a block hanging on the same side of the mast just below the hounds, through a block hooked to the peak of the jib, aft through a similar block on the opposite side of the mast from the first one, then the upper block of a purchase (luff or two-fold) was turned into its end, the lower block being stropped to an eyebolt in the deck abreast the mast. In setting the jib, it was hoisted by the hauling part until the luff

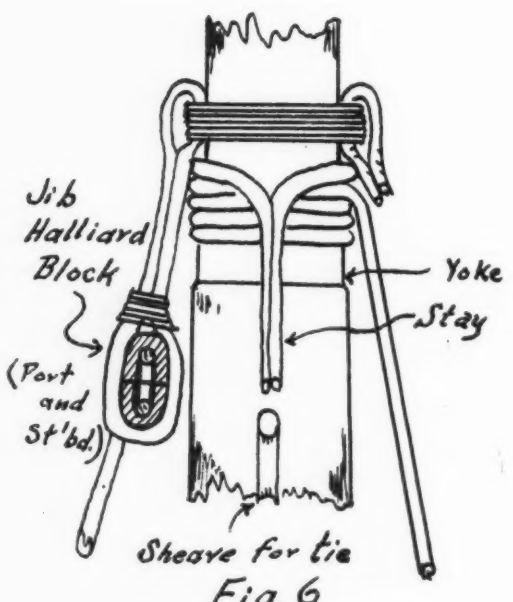


Fig. 6

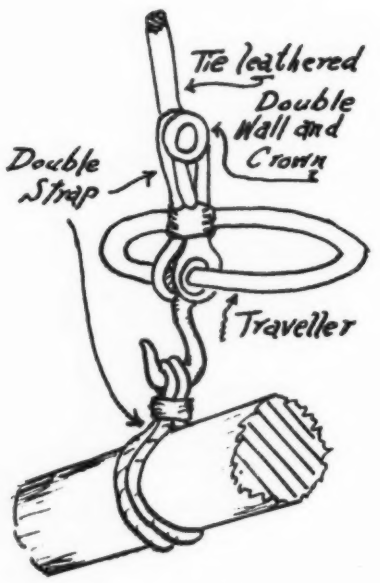


Fig. 7.

was as taut as possible; the hauling part was then belayed and the halyards "sweated" by housing the purchase. As the jib was set flying (not on a stay), the stress in the halyards caused the rope to stretch, requiring "bousing the jib" at frequent intervals. To avoid this, after round link chain had come into use, it was used for the jib halyards, the chain (when the sail was hoisted) reached nearly to the deck and having a tail rope in its end for convenience in belaying. The blocks of the masthead were stropped in such a manner that they hung with their pins athwartship - one method of accomplishing this result is shown in Figure 6.

The jib sheet pendant had a single block in each end and a thimble and hook or a toggle seized into the center of the bight to put in the clew of the sail. The standing part of the sheet is made fast to an eyebolt in the wales, then reeved through the block in the end of the pendant and inboard through a sheave in the side.

Running Rigging of the Sails on the Main and Foremasts:

The tie, which according to Nogués was of white (untarred) shroud-laid rope, passed through a sheave in the mast. See Figure 6. If the sails were outside the shrouds its standing part was before the mast; if they were inside sometimes it was before, more usually abaft the mast. According to Forfait it was bent to the yard and the hook on a traveller on the mast was hooked to the band it self. His plate fails to make his meaning clear but I think that, although the term he used (amarrage) does not mean strop, there must have been a strop, since there was considerable drift between the yard and the eye of the strop and either this eye received both the tie and the hook or there was a second eye below the first that received the hook, as is mentioned by a Dutch book. Figure 7 shows the arrangement described by Nogués, which is the same as seen in the photographs except that in the latter the strop on the traveller is replaced by a shackle which carries a thimble around it to which the tie is spliced. Other arrangements were used, the desideratum being that the yard be held onto the mast but not so closely as to prevent its necessary movement. The strop on the yard was either kept in place by cleats or had lashing eyes and was lashed on tight.

The tie had a treble block spliced or turned into its hauling end and this was connected by its fall to another which was stropped to an eyebolt either immediately before or abaft the mast. Previously it was not before the center of the mast but was placed sufficiently to the side so that when the fall was lead along aft for manning it would clear the mast.

According to Nogués the peak halyards were rove up through a block on the after side of the yoke and the standing part made fast to the peak. Lescallier shows a gun tackle and the photographs of a luff tackle. The latter was very common, with the variation that the standing part was made fast at the peak, the single block some distance within, in order to lessen the bending movement in the yard. In any event the peak halyards were hooked to the strops on the yard.

The sheets of the fore and mainsail were like those of the jib except that their blocks hooked directly to the clew without an intervening pendant. Nogués says that these blocks had swivel hooks - i.e. that they were iron bound - and hooked to shrouds of their own mast when the sail was not set.

For some reason the points of support of the tacks were hooks and not eyes. In small luggers the tack cringle was hooked directly to one of these hooks but where a hemp tack intervened it seems like a waste of hooks. When the luff of the sail made a sufficient angle with the vertical, with every reef taken, the tack

materially approached the mast; if a smaller dipping lug replaced a larger one the same thing occurred. Hence, to give a lead to the tack that would produce a taut luff, hooks appropriately positioned for these varying conditions were necessary. According to Nogues there were three (3) hooks in the fore stock bumpkin; the model in the photographs has two (2) plus one (1) in the stemhead. Moreover, if the sails were inside the shrouds, when the wind veered, the foot of the sail pivoted about a point abreast the mast, hence the point of support of the tack had to be moved aft. Thus there had to be hooks on the bow and if the tack projected outboard, there had to be at least one on the cathead. For the main tack there was a line of hooks along the deck near the waterway (some of these are visible in the photographs) or inside the bulwarks.

The tack itself was a tackle (or a line) hooked to the tack of the sail and the block (or the lower one) was stropped with a thimble that went over the appropriate hook. The rope itself was belayed where convenient. There was only one tack which shifted from side to side when the vessel went about.

According to Nogues there were bowlines on the main and maintopsail which were "bowlined around the mainmast" - belayed to it with a round turn and two half hitches. He says that the foretopsail had no bowline and that the foresail had a "foule", that is, a pole with a thumb cleat on its forward end. The cleat was thrust through a cringle on the luff of the sail and, after being thrust as far forward as possible, the heel of the foule was shoved into one of the notches of a cleat and bolted to the rail or to the inside of the bulwarks some distance abaft the mast. Foules were invariably used on both the main and foresails of 18th century chasse-marees but this is the only mention of one in a lougre that I have come across. Some luggers had bowlines on both the fore and foretopsail leading inboard through blocks on the bowsprit end. Bowlines disappeared in the course of the 19th century, the shortening of the luff due to increased peak and better sail making them superfluous.

I do not know if it were done but I would place a "lizard" long enough to reach to the deck on the lower bowline bridles and also a short one on those of the topsails if these were to be shifted abaft the mast. A bowline lizard was a piece of rope one end of which was spliced around a thimble on the outer bridle and the other around a toggle that was put in an eye in the end of the bowline proper. So fitted, when the vessel went about one would need only to haul the lizard around the mast, otherwise it would mean hauling around the whole bowline. The bowlines had only one bridle and I should think that the upper reef cringle would have been used as the lower bowline cringle although in the pictures the bridle seems to have been placed where it would have been engulfed in the reefs - which actually looks wrong.

Standing lugs had no bowlines.

Many luggers had a brail on all three lower sails. The standing part was bent to the nock of the yard. It passed through the leech cringle of the second reef, then forward through a block on the yard opposite its standing part and then down to the deck.

According to Nogues there was a vertical hole at each end of the lower yards through which the standing part of a brace was passed. These had a double wall and crown in their upper ends which were put in the clews of the topsails and thus served also as topsail sheet and tack. These braces lead inboard over the rails just before the shrouds of the mast abaft, and they are frequently found in 18th century pictures no matter what point of sailing the vessel was on. I think that they must always have been used when the sails were outside the shrouds for if

the topsail sheet and tack had been lead in the manner presently to be described, then their hauling parts would be on the lee side of the lower sails and they would have girded these badly, chafing them and spoiling their set. After about 1820 one finds only braces in pictures when the wind is shown to be far aft and I do not recall ever seeing them on models. French seamen whom I questioned, however, told me that the peak brace was always used but was primarily a downhaul rather than a brace; that a nock brace was only put on when it was necessary to steady the yard and any available line was used for that purpose. Inasmuch as pictures and models do not have to go to sea, whereas such a peak downhaul is as necessary on a lug-sail as it was on a gaffsail, if I were rigging a lugger model I would use the combination braces - topsail sheets and tacks up to about 1820 and a peak downhaul thereafter.

Nogués, speaking of topsails says "the dran also serves as a parral. The hale-dran is a sort of downhaul and leads down abaft mast". Also the dran was put over the topmast head before the topmast rigging and the topsail tie was passed through the eye of the dran. Although I have never heard the word dran used in this sense elsewhere, he evidently means a traveller that played on the topmast and that had an eye on it. The topsail tie was reeved through the eye before being bent to the yard. If the hale-dran was a rope attached to this traveller it is evident that if it were taut, while the halyards were kept fast, the topsail yard would be kept close to the mast (serve as a parral) whereas if the halyards were let go the hale-dran would haul the topsail yard down to the cap. The standing part of the topsail tie would be before the mast if the sails were carried outside the shrouds, it might be either before or abaft if they were inside but I think the subject had better be left until later.

Perhaps about 1820 a different method of rigging the fore and main topsails came into use. Instead of the brace - tack - sheet combination, the topsail sheet and tack lead through a sheave in, or a block or thimble at, the ends of the lower yard, then through blocks under the yard and a little abaft of the mast and then down to the deck. They generally belayed under the shrouds. When the standing part of the tie was abaft the mast the sail generally had a clewline, the standing part of which bent to the yard at the slings and it rove through the clew of the sail, then forward on other side of the sail through a block on the yard opposite the standing part and then down to the deck.

The mizzen topsail must always have been rigged thusly, as there were never any braces on the mizzen yard.

The Running Rigging of the Mizzen:

The mizzen was always a standing lug and hence was always carried on one side of its mast. The standing part of both the lower and topsail ties were abaft their masts - up to the early part of the 19th century there was usually no topsail. The halyards were, of course, before the mast and they were lighter and more simple than those of the fore and main yards. Sometimes there were no peak-halyards (although a standing lug really needed it more than a dipping lug) and when they existed they were also likely to be in a simpler form. In small luggers the tack cringle might simply hook over a hook bolted rigidly to one side of the mast, but there might be a hemp tack or a tack-tackle so lead as to place the tack of the sail to one side and a little abaft the mast. Sometimes the standing part of the mizzen sheet was made fast to the end of the bumpkin, it reeved through a block on the clew, then through a sheave in the end of the bumpkin and inboard. But if the leech of the mizzen made a considerable angle with the vertical, there was a traveller on the bumpkin which carried the standing block of the mizzen sheet. An outhaul and an inhaul were bent to the traveller; the latter lead directly

inboard, the former went through a block or sheave at the end of the bumpkin and then inboard. The standing part of the mizzen sheet was bent to the strop of the block on the traveller; it then lead through the block on the clew and then on the traveller and inboard. When the sail was reefed the traveller was moved in along the boom, thus giving the sheet a lead that kept both the leech and the foot of the sail taut.

The rigging of the mizzen topsail has already been described.

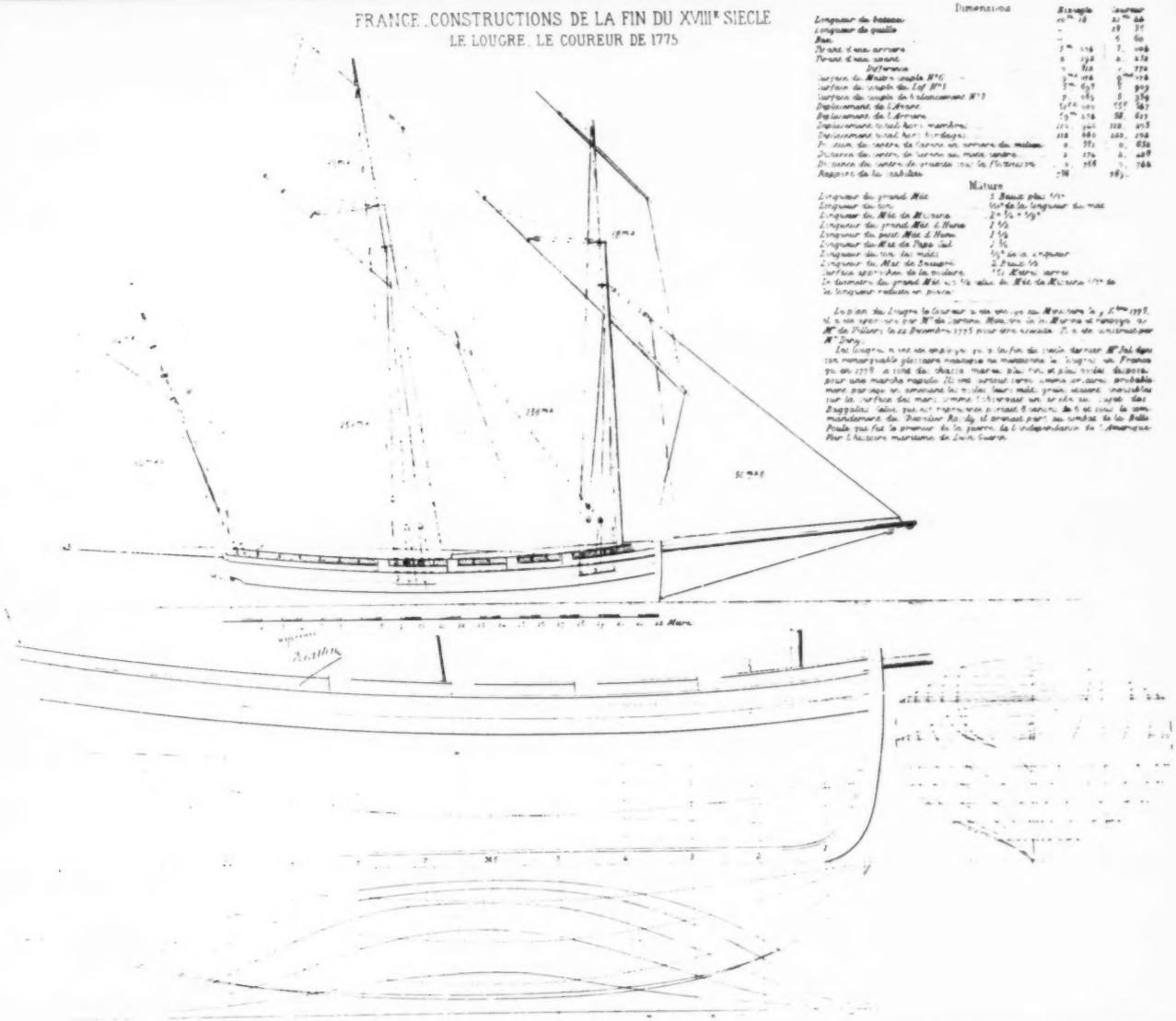
When it was intended that on one tack a lug sail should be set to the windward of the mast, it was provided with a mast lining to protect the sail against the resulting chafe.

Manner of Handling a Lugger:

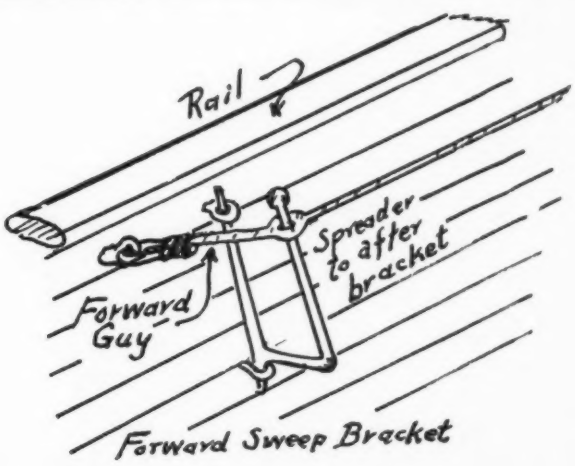
According to Nogués (who is speaking of a vessel with the sails inside the shrouds) when a lugger was turning to the windward she set the mizzen and foresail on one side of the mast and the mainsail on the other. Then when it went about it was only necessary to haul over the fore, main and jib sheets, shift the main tack from one side to the other and shift the main bowline and the foule, the fore tack not being touched (because it boarded amidships). He neglects to mention the braces and the shifting of the tacks of the main and fore topsails over the stays. Since the foot of a fore-and-aft sail bent to a yard or gaff always makes a smaller angle with the keel than the head, the mainsail, where the tack was boarded well to the windward, probably did not press so much against the mast, but this would not be the case of the topsails and still less in the foresail. Doubtless it was resorted to in the case of a vessel having to make a series of short boards and where speed was not important, but I doubt if it were a normal practice - not one to commend itself where the most trivial difference in speed or weatherliness might mean the difference between liberty and the horrors of a British prison-hulk - and 40 years later the writer Bonnefoux still termed it vicious.

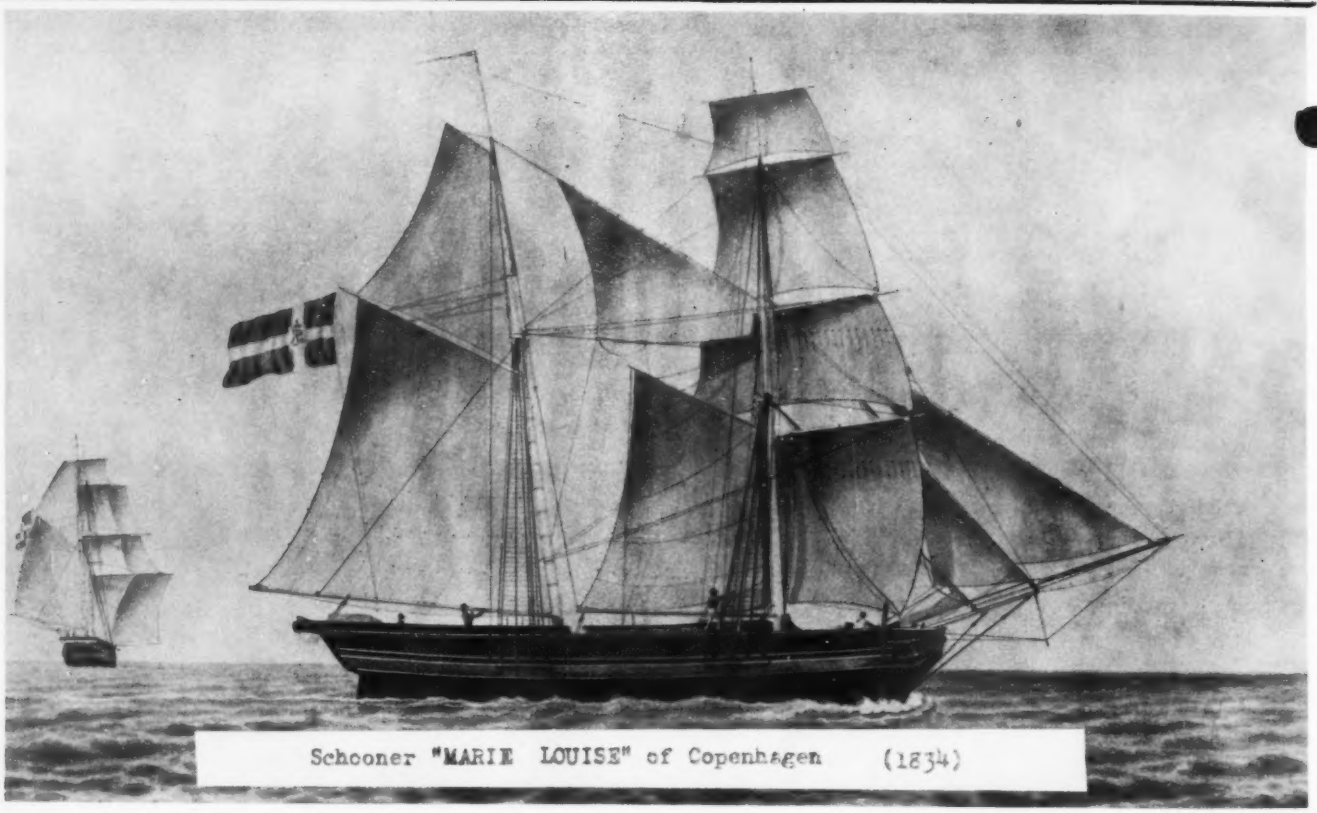
A French archacologist described to me the manner of shifting the fore and mainsails when they were outside the shrouds as follows: When the vessel came up into the wind the lee shrouds were overhauled and their bights gathered in and forward to clear the nock of the yard as it was lowered on deck. The shrouds were immediately set up again, the mast tie, tack and bowline were cast off, the sail and yard carried around abaft and to the other side of the mast by hand, the tie passed around before the mast, the tack before the mast and shrouds and both were clapped on. As soon as it was evident that the ship was not going to miss-stay, the weather shrouds (of the former tack) were similarly overhauled and the sail reset as before. Forfait says that the forward lee shroud was left overhauled but it is generally shown taut in pictures.

When the sails were inside the shrouds and the standing part of the tie was before the mast, the sail was changed in the same way except, of course, that the shrouds were not touched. But when it was abaft, it was only necessary to cast off the bowline and tack, lower the mast halyards sufficiently to peak the yard up and down the mast, trip it's nock around abaft the mast to the outer side, clap on the bowline and tack and reset the sail.

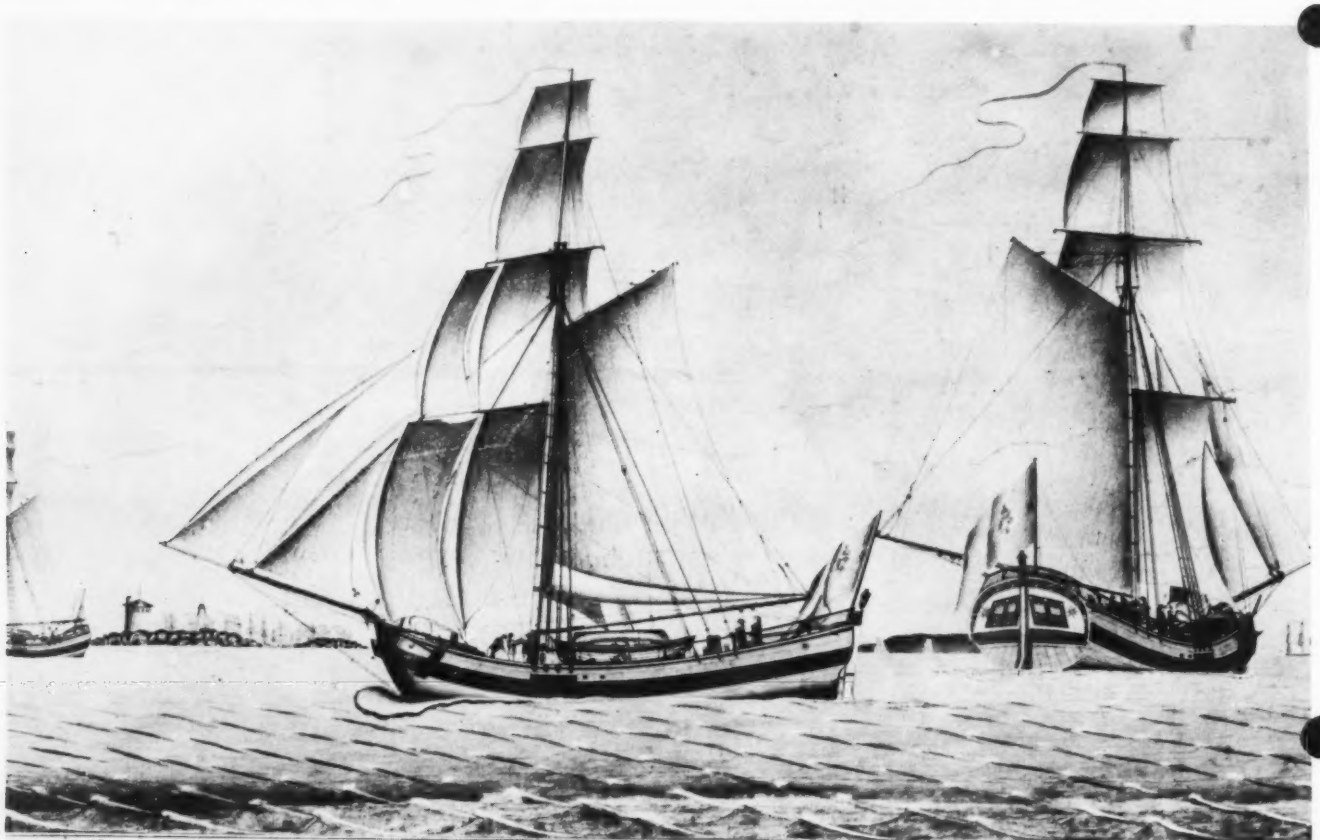


Plans of a French Lugger taken from the Admiral Paris Collection. Courtesy of the Minneapolis Public Library and Mr. James Ferguson.





Schooner "MARIE LOUISE" of Copenhagen (1834)



·SLOP·DIE·FRAVNARICA· von S:ØRGEN·HÖIRE von SCHIFFER·ØRGEN·PAVLSEN· 1802
(FLENSBURG.)

I have never found out how a topsail carried outside the shrouds was changed but I think one may infer how it was from the following: Pictures show the topsail halyards leading down to the rail abaft the shrouds; therefore the topsail was lowered on deck, for the halyards would have to be let go to shift the lower sails when they were outside the shrouds. A model apparently dating from rather early in the 19th century which has the standing part of the topsail tie before the mast, has a downhaul bent to the nock of the yard leading down to the deck to the windward of the sails and before the mast. Therefore a way was to haul the sail down on deck to the windward and before the mast, presumably letting the sheet unreeve. When down on deck the tack and sheet were shifted clear for resetting while the lower yard was also on deck, the tie and bowline remained clear. The sail could be rehoisted immediately before the lower yard, gathering in the slack of its sheet and tack as the two yards went aloft. Besides tack, sheet, halyards and downhaul (perhaps a hale-dran and bowline) as far as I know these sails had no other gear.

When the standing part of the topsail tie was abaft the mast one could let go the bowline and tack, partly lower the yard and have a man or two aloft trip the nock of the yard around abaft the mast and let the yard fall across. This would have the effect of wrapping the part of the sail adjacent to the tack around the masthead; the foot of the sail was gathered in till the tack clew would be reached, the tack was taken out of it, dipped under the stay and around the masthead and put back, and the bowline lizard taken out, passed around the masthead and toggled again into the end of the bowline (if any). If there were a stay on the topmast abaft, the sail had also to be clewed up and the sheet taken out of the clew and replaced after being dipped under the stay. This sounds difficult but apparently it was not, for although one would think a clewline on the tack clew would have helped, yet I have never seen one in a picture or on a model and I have been told one was never used.

Some luggers carried topsails in the form of the standing lug gaff topsails used in English schooners and cutters in the first half of the 19th century where the tack went directly from the sail to the deck along the mast, and this form was sometimes carried at the fore while the dipping type was carried at the main. It is evident that the model in the photographs could only carry this type of topsail, due to the lead of her lower stays. This type of topsail was changed in luggers the same way as in other vessels but it did not actually have to be changed unless a stay on the topmast abaft made it necessary. A model of a lugger built in 1775 in the Paris museum has this type of topsail but I doubt if they were used (and then only exceptionally) until well after 1800.

I have neglected to say that the topsail halyards were nothing more than a runner rove through a block in the end of the tie, there being a sheave in the topmast close below the hounds for the latter. If there were a clewline it served as a downhaul when the sail was taken in and lead down to the deck abaft the mast.

If the sails were between the mast and the lee shrouds when the wind veered (drew more aft) and since that space between was very restricted, it was necessary to overhaul the lee shrouds progressively to permit the yard to assume a greater angle with the keel to avoid chafe. As the foot of the (main or fore) sail pivoted around the mast it was necessary to move the standing block of the tack aft as well as veer the sheet. But if the sails were outside the shrouds the tack was not shifted, but like the course of a square-rigger, the foot of the sail pivoted about the tack, so that while it remained (more or less) parallel with the head, it stood farther and farther away from the mast as the sheet was veered. When the wind drew abaft the beam, if the tack extended sufficiently before the mast to make it

come outboard, the weather sheet was hooked to the tack-clew (passing outside the shrouds) so that the sail had "both sheets aft" as in a square-rigger.

Nogues mentions this overhauling of the lee shrouds but says that with the wind aft the yard was dipped underneath and before the shrouds. In this he differs with French seamen whom I have questioned. The seamen said that the yard was only so dipped if the shrouds were set up by deadeyes; if they were a bastaque or a candelette they were overhauled the amount necessary to permit the yard to assume any position, the slack bights being gathered forward and confined with a turn of line so as not to chafe the sails, and the candelette (mast pendant tackle) was set up well aft to support the mast. A passage in Forfait (already alluded to) may indicate yet another method. He says that whenever a shroud interfered with trimming a sail it was set up to another point. Inasmuch as elsewhere he simply says that the forward shroud was unhooked to facilitate trimming the sails outside the shrouds, but seems to mean that, with the yard inside the shrouds, as soon as it was brought up against the other shroud, this were dipped bodily over the yard and set up farther aft. Yet another way was to dip the hock of the yard around and to the windward of the mast. When the standing part of the tie was abaft the mast this method did not wrap it around the mast, the yard would make a greater angle with the keel than a gaff would and gear (such as topsails, sheets and tacks) belayed inside the shrouds did not have to be shifted forward, but the sail chafed against the mast and shrouds. To shift the sail before the shrouds it was necessary to take off and replace the peak-halyards and both lower and topsail sheets after passing them around the shrouds.

With the wind very far aft the main and foresails were carried wing-and-wing, and Nogués says that they were boomed out, "the boom receiving the sheet" and having a forward guy. (He does not say how the heel of the boom was secured.) I have never met any other evidence of such a practice and doubt if it were in the least bit common.

In harbor the main and fore yards were suspended so as to afford headroom beneath them, the mizzen yard was peaked almost up and down the mast. It will be noted in the photographs that the topsail yards are stowed up-and-down the shrouds.

On her cruising ground a lugger would heave-to under bare poles so that her slender top-hamper was scarcely visible. Thus, seeing yet unseen, she would wait - "like a snake in the grass" as a contemporary Englishman indignantly said - the appearance of a sail.

It is evident from the preceding that, compared to a gaffsail vessel, the handling of a lugger presented many inconveniences, and Forfait said one required not only a strong crew but one composed of prime seamen. When the nature of her employment required that her decks be swarming with men, this circumstance probably had little force and, by dint of "stationing" and drill these changes could probably be affected with extreme rapidity - a Dutch officer said that a ship carrying topgallant studdingsails that could take a reef in the topsails and have the studdingsails reset in three minutes could be said to have a tolerably smart crew.

I append:

1. In the list of spars of two luggers taken from Forfait, which he says may be taken as giving maximum and minimum dimensions, it can be seen from even the minimum case how enormously heavily sparred these vessels were. What is more remarkable, says Forfait, was the fact that they would carry all sail when

other vessel had begun to shorten down. According to his calculations, their center of effort was lower in proportion to their sail area than in other vessels, but I think their "carrying on" must be ascribed rather to the skill and nerve of those who sailed them, rather than to anything peculiar to the rig. "What she can't carry she can drag" and "while she cracks she holds" must have been maxims held in honor among them.

2. A rigging list of a lugger of "10 or 20 guns" (probably of much the same size as the vessel in the plans) taken from Lescallier and which is included is full of omissions and errors but I have included it as it is the only one I have ever seen. I have corrected the latter where the error is evident.

Addenda:

It will be noticed in the photographs that the peak halyard block is stropped to an eyebolt in the side of the masthead. This is found in pictures of the early 19th century, but with the variation that the strop is long enough so that, when the peak of the yard was on the other side, the leathered strop rather than the halyards would rub against the heel of the topmast. The strop should be such that the pin of the block remains horizontal.

Luggers generally had sweeps; there was a sweep-port (about 12" inches square or large enough to pass through the blade of a sweep) between every pair of gun-ports. Sometimes the sweeps were stowed outboard in iron brackets on the quarters. The forward bracket was somewhat abaft the after gun-port, the after one near the stern. As the distance between the two was not very great the sweeps when stowed sometimes projected somewhat abaft the stern. The brackets were hinged about a vertical axis so that they could be swung fore-and-aft when alongside some obstruction.

French and Dutch vessels, instead of having a woodlock to keep the rudder from unshipping had what was called a brague. Sometimes this was a piece of served rope passing through a transverse hole in the rudder near its forward edge and not far above the load line. The ends were secured to eyebolts in the butlock so that the brague had a U-shape. It was slack enough so that it slid through the hole when the rudder swung but not so slack as to permit much vertical movement. A better way was to have an eyebolt with a thimble in each side of the sternpost near its after edge and near the load line and a similar pair on each side and near the fore edge of the rudder some distance above the first so that a line between a lateral pair made a considerable angle with the horizontal. A piece of line was then passed through the eyes of each lateral pair of bolts, spliced together, served and the thimbles seized in the opposite bights. This brague would permit the rudder to swing and yet prevent almost any vertical movement.

Since a lugger steered with a tiller (without a wheel) it might be well to say that the hauling part of the tiller-tackle falls lead from the blocks on the tiller and not from those at this ships side.

In closing I wish to express my obligation to Monsieur P. J. Bruhier of Cannes, France for information given me. It would be difficult to find a surer guide.

---OO---

The following tables complete the report on rigging a lugger. We are deeply grateful to Mr. Dennis for such an unusual article and trust that it will prove of value to members of the Nautical Research Guild. (Secretary)

Spar Dimensions of Two Luggers from Forfait, 1788

Length	72	60
Beam: Length	0.288	0.258

		Length	Diam	Masthead or Pole	Length	Diam	Masthead or Pole
As multiple of beam	Mainmast	3.603	1/52	1/10	3.445	1/54	1/11
	Foremast	3.176	1/49	1/9	2.759	1/50	1/11
	Bowsprit	2.794	1/35	-	2.649	1/38	-
	Mizzenmast	2.313	1/49	1/12	1.888	1/54	1/16
	Maintopmast	1.794	1/39	1/6	1.091	1/48	1/7
	Foretopmast	1.470	1/44	1/6	1.091	1/48	1/7
As function of length	Mainyard	0.742	1/53	1/36	0.573	1/59	1/36
	Foreyard	0.661	1/52	1/34	0.454	1/54	1/34
	Maintopsail yard	0.495	1/60	1/10	0.424	1/68	1/10
	Foretopsail yard	0.429	1/60	1/10	0.393	1/65	1/10
	Mizzen yard	0.379	1/60	1/24	0.364	1/65	1/24
	Mizzen bumpkin	0.420	1/40	-	0.364	1/41	-

Position of masts and centre of effort with respect to longitudinal centre as a function of length.

Main	0.072 abaft	0.04 abaft
Fore	0.396 before	0.364 before
Mizzen	As near taffrail as possible	
Centre of Effort	0.037 before	0.024 abaft

Rake or Steeve

Main	1 1/4 : 12	1 : 12
Fore	2/3 : 12	1/3 : 12
Mizzen	2 1/2 : 12	2 : 12
Bowsprit	2 : 12	1 3/4 : 12

Ratio of Height of Centre of Effort above Load Line to Beam

1.902	1.576

Ratio of Sail Area to Area of Rectangle Circumscribed on Load Line Surface

5.242	4.037

Note: Probably length of lower masts is measured from upper side of keel.

Rigging of a Lugger of 12 to 14 Guns from Lescallier, 1791

	No.	Length	Circum.
Mainmast			
Stay	1	13	6 1/2
Tack (double)	1	20	2 3/4
Shroud Pendants	4	34	5 1/2
Shroud Runners	4	20	3 1/2
Tie	1	10 1/2	5 3/4
Halyards	1	45	3 1/2
Braces	2	50	1 3/4
Lifts (?)	2(?)	50(?)	1 3/4(?)
Bowlines	2	40	1 3/4
Parral Rope (?)	1	17	2 1/4
Maintopmast			
Stay	1	17	2 1/4
Stay fall	1	8	1 1/4
Shrouds	2	26	2 1/4
Shroud fall	2	12	1 3/4
Tie (single)(?)	1	30(?)	3 1/2
Halyards	2(?)	28(?)	2 1/2
Foremast			
Shrouds	4	32	5 1/2
Runners	4	20	3
Tie	1	9 1/2	5 3/4
Halyards	1	40	3 1/2
Tack	1	20	2 3/4
Braces	2	50	1 3/4
Lifts (?)	2(?)	48(?)	1 3/4(?)
Bowlines	2	38	1 3/4
Foretopmast			
Stay	1	25	2 1/4
Shrouds	2	26	2 1/4
Shroud fall	2	16	1 3/4
Tie (double)(?)	1	30(?)	3 1/2
Halyards	1	28(?)	2 1/2

	No.	Length	Circum.
Mizzenmast			
Shrouds	2(?)	9 1/2	4 1/2 *
Tie	1	10	2 1/2
Bumpkin Shrouds	2	7 1/2	3 3/4
Tack	1	12	2 3/4
Bowsprit			
Bobstay	1	8	3 3/4
Fall	1	6(?)	2
Jib Halyards	1	36	3 3/4
Jib Sheet	1	18	3 3/4
Jib Outhaul	1	17	5
Jib Inhaul	1	30(?)	2
Bowsprit Shrouds	2	14	4 1/4
Other			
Rudder Pendants	2	7 1/2	3 1/2
Cable	1	120	9
Cable	1	120	8
Cable	1	120	6
Hawser	1	100	4
Hawsers	2	180	3 1/2
Ring Stopper	2	14	4 1/4
Buoy Rope	3	100	4
Buoy Rope for Stream A. Shank	1	25	3
Painter	4	32	4

* (a candelette)

Length in fathoms of 5 French feet. Circumference in French inches (12 inches equal 1 foot equal about 1.065 English feet). Interrogation marks indicate items that appear dubious. Lescallier called the peak halyards "lift" but the corresponding circumference seems rather small and length too great. I have no idea of what is meant by parral rope.

---OOO---

Foreword

Seattle, Washington, April 22, 1957

Dear Mr. Harbin:

Some two months or more ago, I had a letter from Herb S. Scott saying the plans, rigging and sail, of the bark "OTAGO" were nearing a state of completion and since this work has been promised to the "JOURNAL" even when Mr. Hamilton was alive, I do hope to see it appear at an early date. You are aware Mr. Scott has done an excellent job - - -.

I have, as you will see, confined any text to the story of the "OTAGO" in terms of Conrad mostly. "OTAGO" without Conrad, I am afraid, would appear to the average reader of no more than passing interest. I know I have covered the "OTAGO" and Conrad along somewhat similar lines before, though less completely, but to present the bark without the romantic background of Conrad would seem a waste of time to all concerned. -- It has taken me many years to run down such historical data as hereafter presented, including even original drawings from the builders in Scotland.---

Some special note or explanation is in order regarding the tripod structure supporting the standard compass. In the early days of iron and steel sailing ships, there was evidently much difficulty along these lines. This was before the "Flinders Bar" and other compensating agencies made this ungainly feature unnecessary.

THE "OTAGO"

By Captain P. A. McDonald

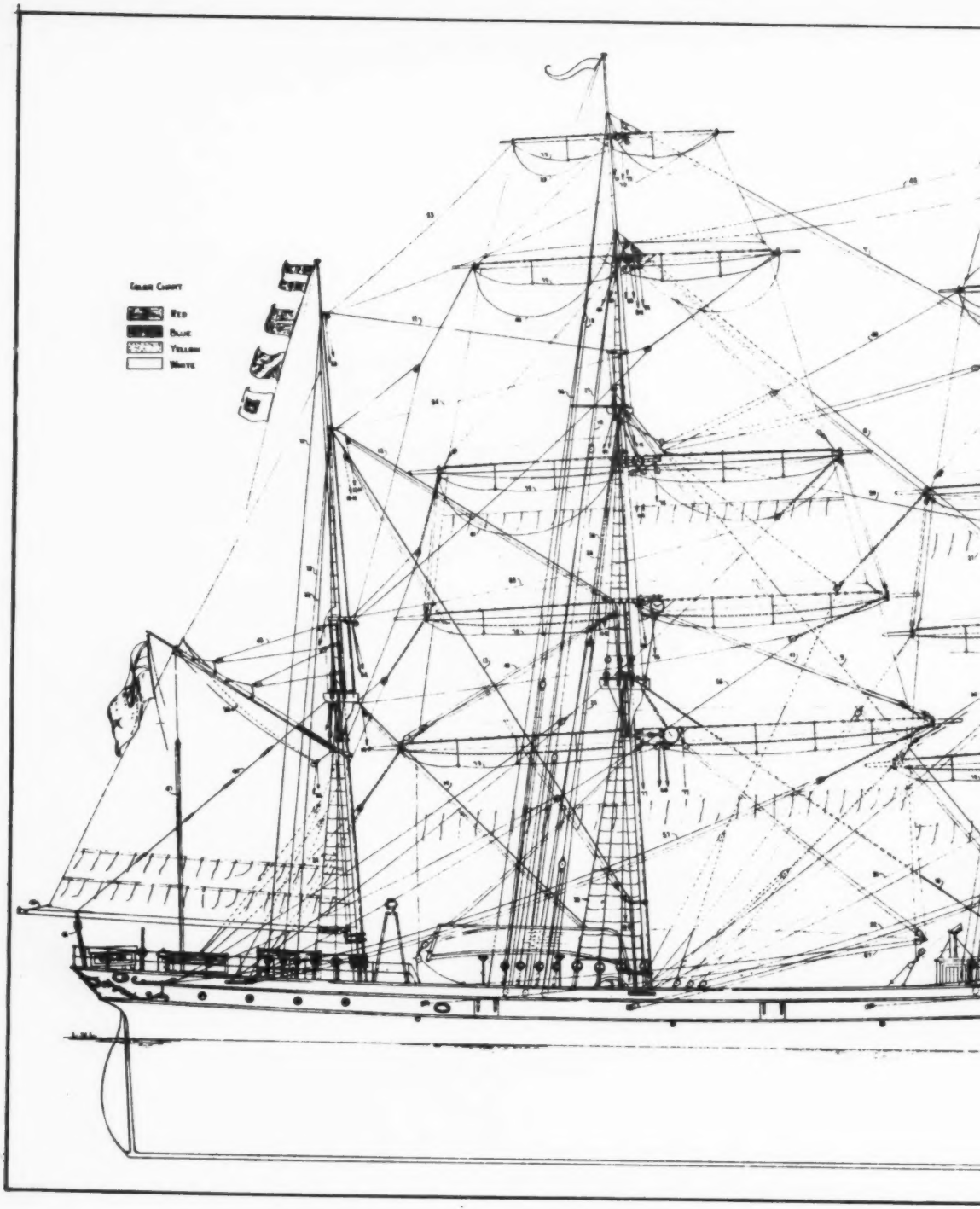
"Yes, there she was. Her hull, her rigging filled my eye with great content. Among her companions moored to the bank, all bigger than herself, she looked like a creature of high breed - - an Arab steed in a string of cart horses".

Such is the recorded impression, the reaction upon Joseph Conrad when first beholding from a distance the Australian bark OTAGO of which he had unexpectedly been appointed Master following the passing at sea of her former Captain. The scene and date are Bankok, January 1888. The quotation is from the semi-autobiographical "Shadow Line" published some twenty-seven years afterward.

It was out in Singapore that Conrad, then a quite young and equally obscure man, had in a moment of boredom chucked his Chief Mate's billet of a little steamer trading amongst the islands of the Malayan Archipelago and had taken lodgings in the local Sailor's Home when the offer came to him to proceed to Bankok to take command of the OTAGO, which had recently arrived there in charge of her Chief Mate.

The little steamer was the 350-ton VIDAR, Captain Craig, and though poking into creeks and river inlets and into veritable ratholes to take on and deliver cargo and passengers, was at first both colorful and interesting to Conrad, he found after six months the much stressed glamour of the East as viewed from the deck of a prosaic little trader had palled and was not quite equal to or compensate for a life under sail. Furthermore, she was, after all, only a steamer and as such probably not entitled to that ungruding devotion and loyalty one would bestow upon a wind-driven ship.

The iron bark OTAGO of 367 gross, 346 net tons, Conrad's first and only command in sail, was built by Stephen & Sons of Glasgow, 1869, and as the name would imply, presumably for the New Zealand trade. Although no Clipper, the OTAGO on her maiden voyage distinguished herself by going from England to Adelaide, thence to Sydney and from there to San Francisco and finally back to England in twelve and a half months, carrying four cargoes the while ---something of a feat. On her next


Color Chart
Red
Blue
Yellow
White

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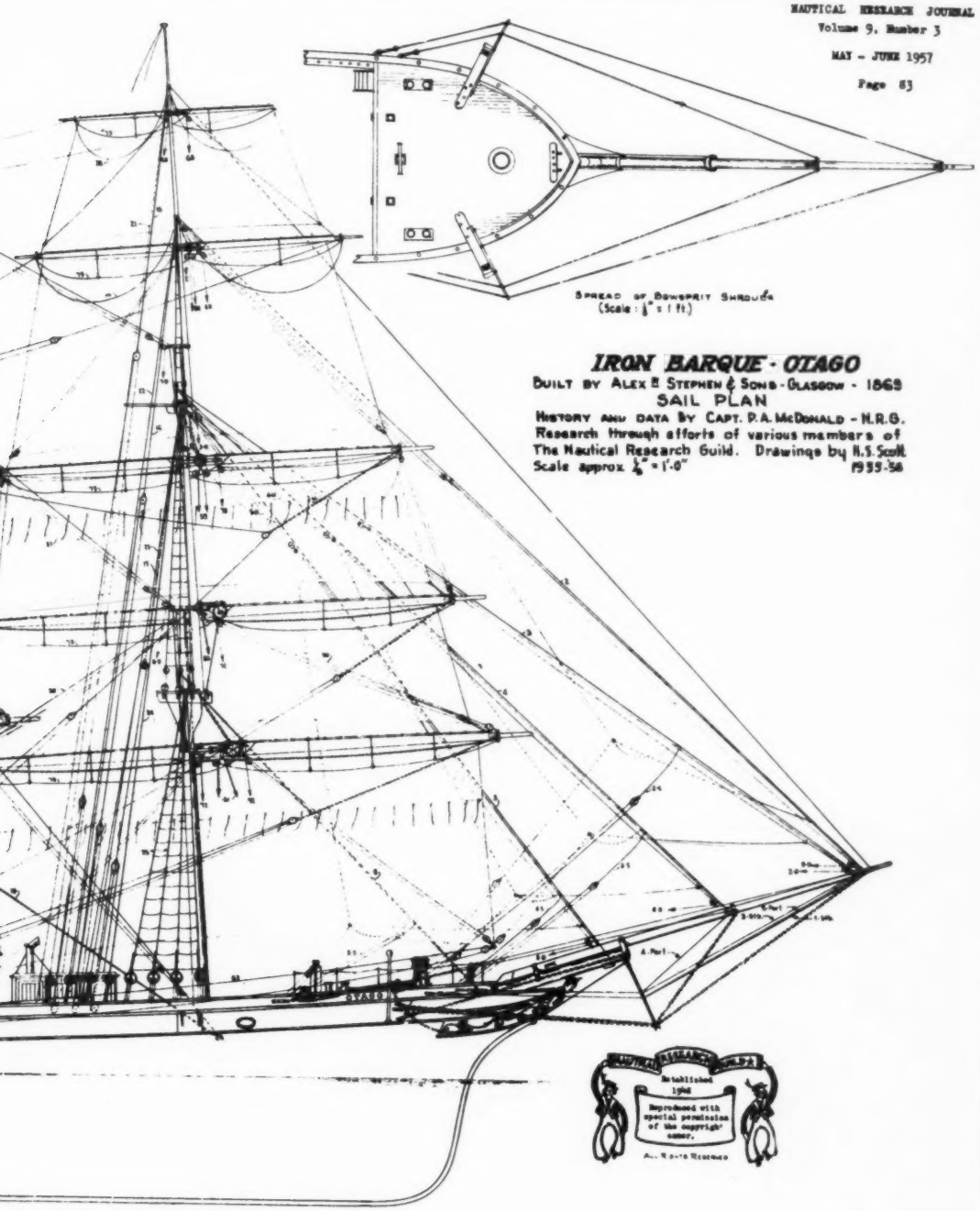

SPREAD OF BOWSPRIT SHROUDS
(Scale: ½" = 1 ft)

IRON BARQUE - OTAGO

BUILT BY ALEX B. STEPHEN & SONS - GLASGOW - 1869

SAIL PLAN

HISTORY AND DATA BY CAPT. P.A. McDONALD - N.R.G.
Research through efforts of various members of The Nautical Research Guild. Drawings by H.S. Scott 1955-56
Scale approx ½" = 1'-0"

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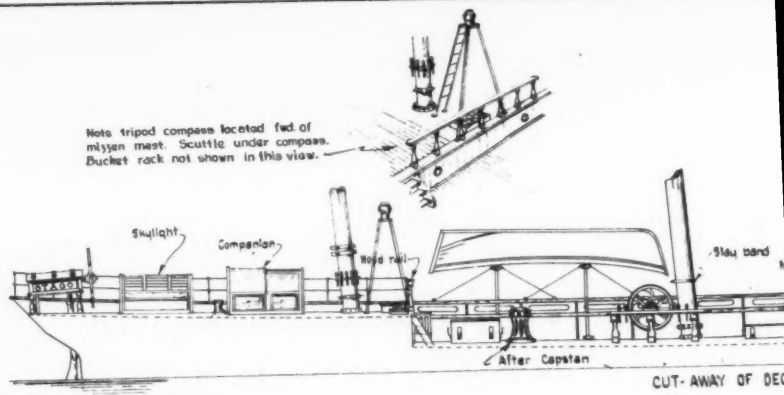
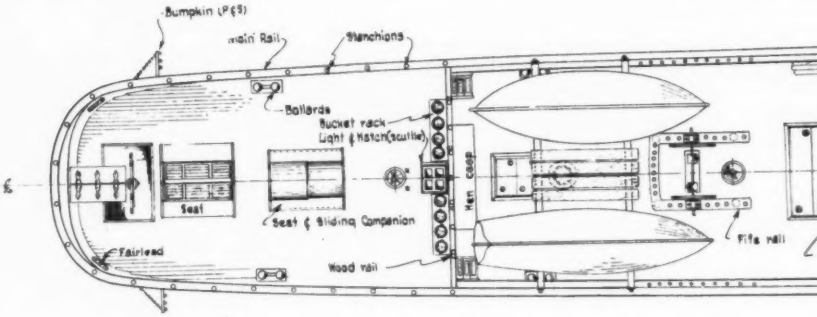
BARQUE "OTAGO"

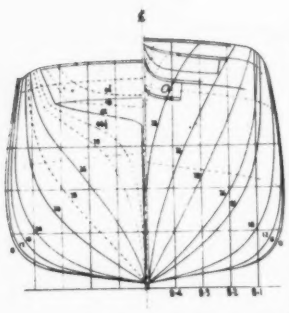
BUILT BY ALEX & STEPHEN & SONS - SHIPBUILDERS - GLASGOW - 1869
FOR THE NEW ZEALAND TRADE. 360 Tons - IRON - 147'2" x 24'
Reconstruction and drawings by H.S.Scott - N.R.S. - History and data by
Capt. P.A.McDonald, N.R.S. Reference Nautical Research Journal, April, 1950.
Without the aid of the following these plans could not have been drawn.
Capt. P.A.McDonald and his years of Conrad Study; James N.Hastings for
reconstruction of body lines; Capt. Harry O'May & Mr. L.S.Rogers of
Hobart, Tasmania; H.A.Underhill of Glasgow; Alex. Stephen & Sons, Glasgow.
Credit also is due the following:
University of Otago, Dunedin, N.Z.; various members of Nautical Research
Guild and others for their interest and good will. These plans
drawn for first printing in Nautical Research Journal. H.S.Scott. 1956

Note tripod compass located fwd of mizzen mast. Scuttle under compass. Bucket rack not shown in this view.

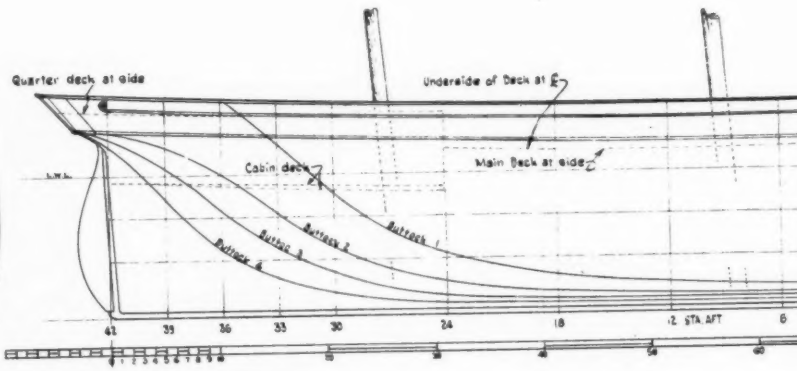


CUT-AWAY OF DEC

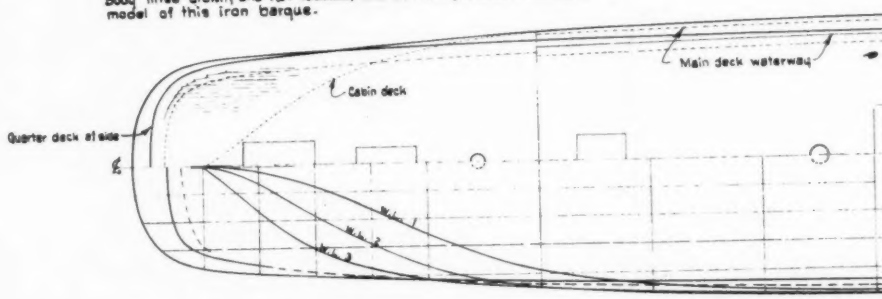




BODY LINES



NOTE TO MODELERS:
Body lines drawn, and not labeled, are of no importance in building model of this iron barque.



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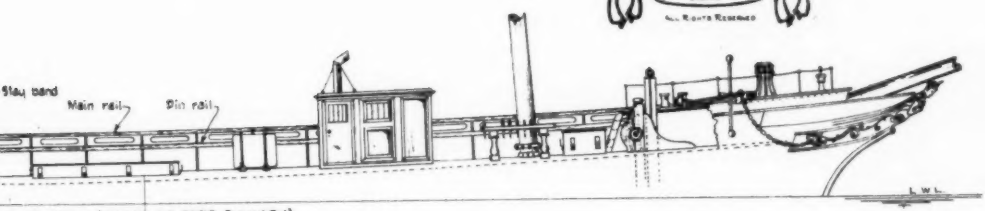
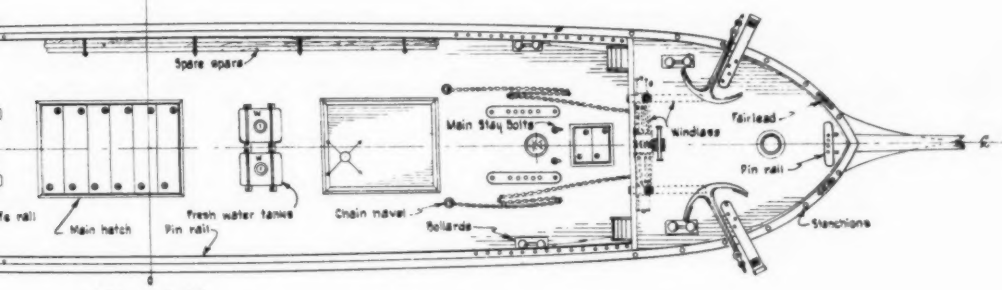
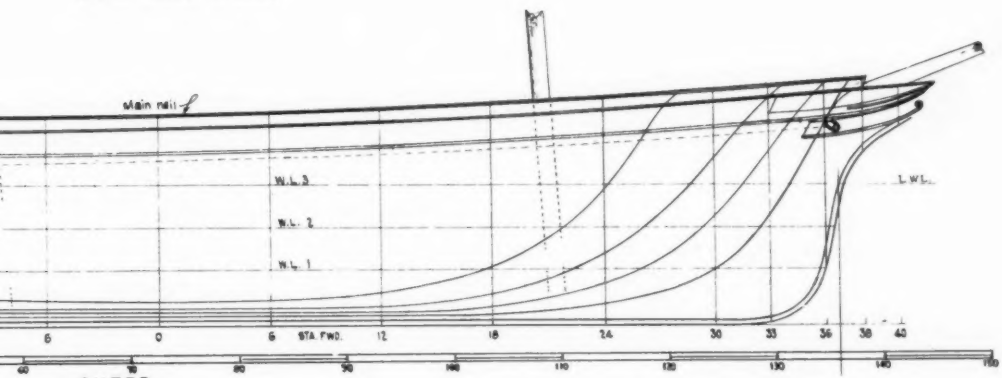


AY OF DECK (INSIDE OF PORT BULWARK)



DECK PLAN
(Stations omitted for clarity)



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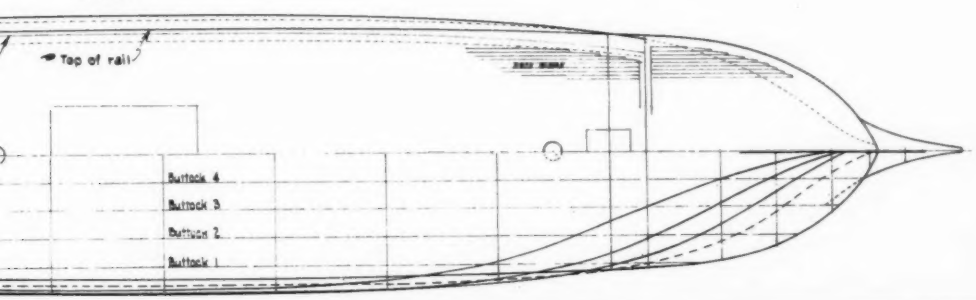
PLAN



voyage, we find her going out to Port Chalmers, New Zealand, in 85 days, also a good performace. A Captain Cameron was her early Master.

From 1871 and onwards, the OTAGO was Australian owned and operated, and we find her voyaging chiefly to ports in Dutch East Indies, South China Sea, Intermediate Australian Coastwise, and frequent voyages to Mauritius. This little iron bark differed but little from the great number of small iron and steel ships, barks and barkentines, former deepwatermen, tramping the sea-lanes, eking out an existence, both semi-coastwise and Indian Ocean, one witnessed in Australian ports well into the first decade of the century. Though well past their first flush of youth, and vulgarized by layers of gaudy colors, these small craft were still quaintly lovely, one remembers.

The OTAGO, like most of her humble sisters, after years of honest slogging of the elements, the obscure fraternity of hulkdom, and finally the burning-ghat - - would, no doubt, have passed unsung and unremembered into oblivion, except for one incident that lifted her from the commonplace to heights of romantic interest.

That incident, this claim to fame by the little bark, rests mainly upon having for a period of eighteen months commanded by the noted seaman-writer Joseph Conrad. Conrad's initial experience in taking over and bringing his charge to Singapore is set down in graphic detail in "Shadow Line" which, though essentially biographical, does contain creations aside.

In view of one's own and the experience of fellow shipmasters, the incident is but a routine one, and the telling of it by the average person would probably have caused not more than a ripple of interest. But the reading of the story as presented by an artist of Conrad's stature makes it something of a classic.

Many of the characters that flit across the pages of Conrad's books originate and belong to the period of the OTAGO and the VIDAR. Almayer, Falk, Lord Jim, Lingard, Willems, and the much vilified hotel keeper Schomberg are but a few of them.

To revert to the movements of the OTAGO prior to and leading up to Conrad's command of her early in January 1888, the OTAGO had cleared from Walleroo, South Australia, July 1887 for Newcastle, New South Wales, to load coal for Haiphong, French Indo-China. She cleared from Newcastle August 10, '87 and eventually arrived at her destination after a somewhat lengthy passage. The time of departure from Haiphong after a prolonged spell in that port is not clear, and her destination, if any, was known to her Master only.

However, in early December '87, we find the OTAGO in the vicinity of the mouth to the Gulf of Siam in what her Mate refers to as the futile and seemingly purposeless attempt to beat against a relentless NE monsoon. It was there on December 8th that the Captain died and was given "a roomy grave" in Lat. 8^{o} 10' N.

No doubt, sensing his approaching dissolution and at the Mate's insistence, the Captain, before he died, said "Well, put your helm up and be damned to you".

In "Shadow Line", the Captain is nameless, only pictured as man of 65 or so. In reality, the Captain's name was John Snadden, born at Kirkcaldy, Scotland, 1837, and thus was only 50 instead of 65. The Mate is referred to as Mr. Burns though his real name was Bohn, we are told.

Directly upon the Captain's giving up the ghost, the Mate shaped a course -not for the nearest port, Singapore, but for Bankok, farther up the Gulf, thereby hoping to have his command confirmed by the owners in Adelaide. Giving Singapore a wide berth was a transparently shrewd move on the part of the Mate. Failing to have his command made good, it was a frustrated and disappointed, even hostile, Chief Mate whom Conrad encountered upon his arrival on board the bark. All that Conrad

knew of his predecessor was from the lips of the red-whiskered Mate who in his disappointment found solace, it seems, venting his spite, amounting to phobia, on his former Captain.

It was a biased and not edifying picture he painted of the man who but recently had found a "roomy grave" at the entrance to the Gulf. The Mate hints at the Captain's strange behavior in Haiphong, and even hints at some affair, a "mixup", a "fling" of sorts with a woman there. All this makes excellent grist for Conrad who lays it on unsparingly. One could wish he had presented the former Captain in a more gentle relief.

Loading of cargo at Bankok went on at a slow pace and with a fever-ridden crew, the passage down to Singapore to complete loading was a long and trying one. Finally, about March 25, '88, the OTAGO with a cargo of sorts took her departure from Singapore, Sydney bound, at which port she arrived May 5 '88. Then followed a coastwise voyage to Melbourne and back to Sydney in the month of July to load a varied cargo for Port Louis, Mauritius. Clearing Sydney early in August, Captin Conrad decided to take his bark "north about" through Torres Strait, a much publicized feat, and arrived at his destination September 30, after a passage of 54 days.

After a long spell at Port Louis, the OTAGO, sugar laden, departed for Melbourne, November 22, arriving January 5 '89. After discharge of cargo at the latter port, the bark proceeded to Port Minlacowie, a small port in South Australia, and loaded there a cargo of wheat for Port Adelaide where she arrived late in March '89.

It was in Adelaide in April or May of that year that Conrad resigned his command of the OTAGO.

The OTAGO, after Conrad, continued to ply the more or less familiar seas until about 1905 when she was rigged down to a towing or storage hulk doing duty first in Sydney and later in life for twenty or more years served as a coal hulk in Hobart, Tasmania. Chafing and fretting at her moorings for many a year, there came a day in the 1930's when no longer in demand even as a coal hulk - she was sold to a junkman for the takeaway price of five pounds ($25.00).

The junkman, something of a character, had the hulk towed to a bay some seven miles up the river where the one time Conrad command was stripped of fittings such as capstans and steering gear, and further demolished piecemeal until only a few ribs and bottom plates of the old bark remained. Even the old steering wheel, after being denuded of hub and brass castings, was left in the scarpyard to bleach and warp. Few, if any, gave thought to its romantic value.

It happened one day in the late 1940's, a man from America (a Conrad fan) appeared on the scene and began searching through the rubbish in the yard. He uncovered the OTAGO steering wheel, which he purchased on the spot, and had it shipped away. Eventually, the wheel was installed in the sloop WELLINGTON, the property of the Society of "Master Mariners" in London, and the unveiling of same took place at the dedication ceremony marking the twenty-fifth anniversary of Conrad's passing.

Chagrin and gloom descended on the local "shiplovers" who had taken the OTAGO and her wheel for granted, so to speak, when they discovered the marauding Yankee had come and simply walked away with the weatherbeaten old wheel, the only thing of value that remained.

The junkman, Mr. Dodge, disposed of the OTAGO in his yard where other pensioners or victims of progress were moored while awaiting the blow torch and wrecking bar. He was, it appears, a man of sorts, with a flair for the spectacular. On the final voyage of the OTAGO, approaching and within a half mile of his yard, he decided to negotiate the rest of way by benefit of wind and tide and so in the spirit of reckless bravado, exulting in pride of dual ownership and command, he threw

caution to the wind by casting off the tow lines. Here was an occasion not likely ever to present itself again, therefore it must indeed have been a proud old man, that for a brief spell, strutted the poopdeck of this enchanted old hulk -- alas, too brief, though.

He failed to take into account that Time, inactivity and corrosion had taken their toll so that when effort was made to turn the wheel, lashed amidships for twenty years, there was no response, for the rudder lay frozen in its gudgeons. One can almost visualize the lone old man, in his frantic effort to move the helm so as to have his craft fetch alongside the jetty, instead of plow stem first into it -- an inglorious climax to a shortlived command...

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DRAFTING OF PLANS OF THE IRON BARQUE 'OTAGO'

By H. S. Scott

Drafting of the lines and plans of the iron barque "OTAGO' was begun some four years ago. Prior to that time, Captain P. A. McDonald, NRG member in Seattle, Washington had gathered a considerable amount of material on the OTAGO. In April, 1950 the Guild published several articles on the OTAGO. At that time her wheel was drawn up and a drawing of the old hulk, as the latter was being dismantled for scrap. Since 1950, much research work has been done by Captain McDonald, myself and various members of the Guild in Hobart, Tasmania, among the latter being Mr. L. S. Rogers and Capt. Harry O'May. However, Captain McDonald in Seattle, with his great interest in Joseph Conrad and through endless effort, has gathered the greater part of the information on the OTAGO, and without his efforts we could have hardly drawn up the barque at all.

Drawings of the OTAGO are a result of efforts of the Nautical Research Guild and many members have shown their interest in production of the lines. This is the type of work for which the Guild is best suited, a finished product of historical research through united efforts. There will be errors in the drawings and many differences of opinion, but we hope that more modelers will take an interest in this old barque, made famous by Joseph Conrad. Too much interest has been shown in well known vessels and we have thousands of models of one ship, and seldom two alike.

Lines of the OTAGO were drawn up by Mr. Hastings several years ago and with aid of lines from Alex. R. Stevens and Sons, Glasgow, we have constructed final drawings. We have had several old photographs, paintings, the old hulk itself, and many small gleanings from various sources, all checked as close as possible. However, we had nothing on her figurehead, and we have decided to include figurehead of Scottish Highlander. Do we have a better guess? We are indebted to Mr. Harold Underhill for information on tri-pod compass, which may be seen just forward of the mizzen mast. A picture of the OTAGO is the third sheet of this set of drawings and will appear in the Journal in the near future.

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REPORT TO THE SECRETARY OF N.R.G. BY HOWARD I. CHAPELLE

"Tolland", Cambridge, Md.
June 20, 1957

Dear Jim:

This is to tell you I am now at home after my year of work abroad ---. Turkey gave very limited opportunity for research into old craft for the naval records were not found. There is a fine collection of full-size royal barges of the Sultans, including the 300 year old galley which is shown in one volume of "Souvenirs de Marine" by Admiral Paris. I am attempting to obtain plans that may exist of the smaller craft - all decorated rowing barges - both of the Bosphorous "kayik" model and the European version. The "Kayik" would be particularly interesting. There are a few half-models of naval craft; mostly steam ships of the line and later men-of-war, but there is one sailing ship-of-the-line. Pictures were rare, and except for a few of gallies and ketches, there were but few of sailing craft.

On my way home, I visited the Arsenal at Venice where there are very fine galley models, but relatively little on sailing ships. There are, however, fine models of Venetian small craft used in freighting and fishing; sandals, topos and luggers, etc. I believe there may be some plans available for these. I did get plans of a Venetian galley of the 18th century, two chebecs of the same period, a small Austrian galley of the early 19th century and a Venetian merchant galley of 1750 with incomplete body plan.

There was also an opportunity to inspect the plan catalogs in the National Archives at Copenhagen and found there were many plans there, but little of interest to Americans. There were some gallies and chebecs, also quite a few of English men-of-war of 1727-1750 which may or may not be duplicated in the Admiralty Collection of Draughts at the National Maritime Museum, Greenwich, London. The gallies are of the 1690 - 1764 period. There were some schooner plans there which I did not have an opportunity to inspect and were of the 1770 - 1780 era. They also have plans of two French naval schooners of Marestier's design, I believe, and there were even plans of American armoured ships of the Civil War period. Plans of a few cutters and luggers were also included in the collection.

I had a few days in London and again looked over the Admiralty Draughts. There, I obtained lines of another American-built schooner taken in 1803 from the French (she was built on the Chesapeake supposedly, in 1801), and the hull lines of a large American sidewheel steamer of the 1840's or '50's, the GEORGIA. I found a take-off of Webb's big clipper CHALLENGE and of the clipper ship ORIENTAL, as taken off in London in the 1850's. Hope to get these in a few months. I have found (in Copenhagen) the lines only of one of Josiah Fox's gunboats built at Washington in 1803, and this did not appear to be a duplicate of any in our Archive files. I should be getting the reproductions soon. If the trial shots turn out satisfactory, will order some more from notes I made of the plan catalogues. There are plans which I did not inspect in the National Maritime Museum, Admiralty Draughts, of American Civil War ships (all of the cruisers built toward the end of the war) and am not sure that all of these are in our own Archive files.

During the past two years I have been working on a new Watercraft Collection Catalogue for the Smithsonian Institution. You will recall the old publication by Carl Mitman, which has been a standard reference for so many years, is now out of print and very incomplete so far as the present collection is concerned. I have re-catalogued all but six of the half-models and all but the foreign rigged models already, and am now working on the historical introductions.

In an effort to make the new catalog more informative and useful, we plan to publish lines of many of the half-models and have new photographs of the rigged models. - - - I am sorry I have been unable to consult with members of the N.R.G. during this work, but being out of the country so much has made this impossible. -- It is very difficult to make proper selections that will serve all purposes since the Watercraft Collection is unfortunately lacking in good steamer material. There is relatively little in our National Archives either. I do not want naval craft of course, for the Collection is basically merchant marine and fisheries. I am considering some unpublished Baltimore Clipper material and one or two clipper ship lines. I am undecided about packets at the moment. Much will depend upon the time I have available to develop the necessary plans. I wish there were more photos of the vessels included in the half-model collection so as to reconstruct the appearance of some at least in detail. We can do well with the fishing craft in many cases as there are both rigged and half models of a few individual fishing schooners, as well as some material on boats. On the coasters and brigantines etc. there is no aid.

The steady growth of the Admiralty Collection of Draughts has given me an immense source for research on American development. We are very fortunate that the Admiralty took so much interest in its American prizes and purchases. I have gone through the mss. lists of the R.N. at the Admiralty Library and have also checked some ship's papers and correspondence. There are many contradictions in these records but still there is much useful information that can be applied to plan identification. One of the odd difficulties is that some American prizes of the Revolution were taken into temporary service and, in two cases measured, but these were not taken in permanently, so full records do not seem to have been retained.

I am very much troubled by one element in this study. After 1794 and up until about 1803 the R.N. captured many French ship-rigged privateers. Plans were made of many of these. The plans often show hulls of extreme Baltimore Clipper model. Now, earlier French ship privateers do not show this model, nor do the later French ships - and it is notable that the French naval vessels captured in the 1794-1815 wars, do not show this model. In the British records there are a number of references to American builders in France and to American-built vessels in the French naval and privateer services. Unfortunately there are no names of individuals nor of their building locations in France. The references are commonly casual and so vague as to be useless as references. I attempted to check in French records but have had no success. There are references, also vague and unsatisfactory, to Chesapeake Bay builders going to France and to the West Indies during the French Revolution - before the outbreak of our Quasi-war with France-but again no names, dates, or specific information. I am quite convinced that there was American influence shown in these ship privateers. I can show from plans that the model used in these ship privateers was not in use in France before 1794 for I have combed the Admiralty Draughts and other collections for such vessels back to 1745. It can likewise be shown that the extreme American model was not built after 1803-05 for, again there are a large number of French-built ship plans of after 1803 in the Admiralty Collection and many in the French files; until Marestier began designing Baltimore Clippers after 1825 the type was certainly not built extensively in France.

The important thing about these French privateer ships is that they predate the ANN MCKIM, some are of equal or greater size and most are more extreme in model. For the sake of argument one can say the ship-clipper model was of French source on the basis that the ship-privateers I refer to were built in France. If this is true then why were not French naval ships built on the model? Why do not French privateer ships of 1778-84 show the form? Why was the model dropped after 1803- and in passing I found the building date and site given for most of these French

Continued on page 92

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REPORT OF THE SECRETARY

This has been an extremely busy season for the secretary and though no relief is in sight, there is still hope to make up for lost time during the Fall months. The usual features including "Queries", "Book Reports" and "Letters to the Secretary" will be continued in the next JOURNAL, and it is also planned to present some of the shorter reports that have been held for such an occasion. There is still time and space for more material on whaling and of course, reports on other subjects will be most welcome.

There is still a healthy backlog of correspondence requiring attention, and your indulgence is requested. Letters will be acknowledged at first opportunity, and if there is an unseemly delay - be kind and send a reminder to the secretary that your patience is a mite on the exhausted side - and maybe that will achieve the desired result!

Usually the summer months are somewhat on the dull side for news relative to nautical matters, but this year has been a decided exception. First of all, the Eastern Seaboard has watched with interest the developing public pride in the three small ships SUSAN CONSTANT, DISCOVERY and GODSPEED that were developed for the Jamestown Exposition and the lengthy voyage of the MAYFLOWER with the attendant pageantry of landing at Plymouth. In the latter instance, it would be interesting to know if the merchandise brought over on the MAYFLOWER (wines, brandies, coins, etc.) proved to be a profitable venture, and if the public has responded to public exhibitions as anticipated.

Less fortunate ships of the past also made the news. The HARTFORD quietly sank at her dock in Portsmouth Navy Yard (Virginia) and is beyond repair. Reports reaching the secretary indicate the planking separated at the stem and that was it. It is believed the only possibility of restoration would be a complete reconstruction, The CONSTELLATION is still tied up at a Baltimore dock, and there are reports that nothing has been done toward her restoration to date. Her planking is likewise in very poor condition and unless some remedial steps are taken soon, she will follow the example of the HARTFORD.

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INTRODUCTION OF NEW MEMBERS (continued from Page 91)

RUBIN, NORMAN N. - 10012 Portland Place, Silver Spring, Maryland -- advises he is a model builder, and the secretary hopes to report further on his interests in the near future.

WILKINSON, PETER CARTER - 929 Bay Avenue, Point Pleasant, N.J. - advises he is a model builder interested in rigged ships of unusual type - such as anchor hoys, bomb ketches, etc. He prefers the period of the spritsail topmast and is most interested in broadening his research on naval armament and rig of this era.

INTRODUCTION OF NEW MEMBERS OF N.R.G.

BAADER, J.J. - 908 Willow Grove Road, Westfield, New Jersey -- advises he is a ship model builder and artist and is presently completing a model of the ESSEX. He was introduced by Dick Orr.

BAYLIS, Commodore JOHN S. - USCG, Ret'd. - 416 Highland Avenue, Clifton, New Jersey -- was introduced by Captain Thomas W. Sheridan, The Commodore has pursued his nautical career since 1902. He graduated from New York Nautical School (St. Mary's) in 1903 and sailed around the world in the British Barque ARROW; joined the U.S. Coast Guard in 1907 (retired 1956); and has carried on in the capacity of consultant and arbitrator since then. Commodore Baylis indicates his interests are along historical lines. He is a member of the New York Ship Craft Club. Quite recently, the secretary received a copy of the Autumn, 1956 issue of "News from Home" published by the Home Insurance Co. in which were featured the Commodore's cruise on the ARROW, some data on the New York Schoolship ST. MARYS, and some excellent information on U.S. Coast Guard ships and tenders. The cover reproduction of Chinese artist's rendition of the ARROW in color is very attractive.

BELMES, JOSEPH - 1137 Allerton Avenue, Bronx 69, New York - was introduced by Mrs. Robotti. Mr. Belmes indicates his field of research is world naval history. He served in the French Navy and later in the Merchant Marine of both France and the United States. His voyages ranged between the Mediterranean, the Atlantic and Arctic. He is a collector of models, books on the French Navy, etc. and is a marine artist.

JENKINSON, JOHN BAKER - 79 Delafield Road, Charlton, London S.E. 7, England -- is the Honorable Secretary of the Greenwich & District Ship Model Society and contributing author to the Wembley S.M.S. publication "Sheet Anchor". Mr. Jenkinson is a model builder interested in all sailing vessels used in whaling and smaller sailing craft of various navies. His research reports include design and construction of machine and hand tools useful to ship model builders. During WW II, Mr. Jenkinson served in the R.N. and later in the Merchant Service.

McCAGG, EDWARD K. - 15 Grand Street, Stonington, Connecticut -- was introduced to the Guild by Mr. James Kleinschmidt who reports the gentlemen's interests cover model building, whaling research and marine art. Mr. McCagg is a member of U.S.N.I. and is concerned with the Marine Historical Association at Mystic.

MEALY, JAMES T. - H. & N. 1722, APO 435, San Francisco, California -- was introduced by Mr. Stanley Curry. Mr. Mealy indicates he is a model builder and artist particularly interested in historical notes on fighting ships-of-the-line, their rigging, and battles engaged in.

H. LEWIS SCIENTIFIC LENDING LIBRARY - 4 & 5 Fitzroy Square, London W. 1, England.

MENG, STANLEY L. - 1107 Bensch Street, Lansing 12, Michigan -- We hope to provide details of Mr. Meng's interests when his membership report is received.

MORPHY, JOHN - 1350 Washington Street, San Francisco 9, California -- was introduced to the Guild by Captain Raphael Lobez of San Francisco, who "boosted" the N.R.G. so vigorously that he convinced Mr. Morphy the banking business also had phases of interest in maritime affairs.

PENDLETON, RAYMOND E. - Post Road R.F.D.#1, Westerly, Rhode Island -- is another new member introduced by Mr. Orr. Mr. Pendleton is a member of Marine Historical Assoc. and describes his interests as building ship models. He has built several square riggers, a schooner and is now concentrating on brigs. A favorite project still in the investigating stage is the GJA and anyone having details on her masting and rigging will find Mr. Pendleton an eager correspondent.

privateer ships and none were later than 1800. The short period in which French clipper-ships as privateers were built, their extreme model and marked similarity to the Baltimore schooner model raise questions not readily answered. In 1955 I spent two months working on this matter and it seems to me that this class of vessel was introduced by these nameless American builders, whose influence and activities came to an end when the Quasi-war began. Cutler and I have found many references to sharp-built ship-rigged American vessels before 1800 and I have two plans of such vessels of the late Revolutionary War period, taken from the Americans, besides the plans of the RATTLESNAKE I used in American Sailing Ships.

These French frigates approach the privateer mode, Revolutionaire, and Psyche most nearly. The latter was a privateer (French) bought into the French Navy and employed in the Pacific. She is very nearly on the lines of the ship-privateers I mention. Revolutionaire and Seine, with two less extreme frigates, show marked deadrise but the ends are upright and full in the French fashion. There is certainly no clear picture of the clipper model among the Naval built French frigates. It is also strange that so few captured French brigs show anything approaching the Baltimore clipper model so marked in these French ship-privateers. All of the schooner plans, of French prizes, that have been found and investigated are either American or Bermudian built; some were originally captured British schooners taken in the W.I. or were schooners the French had purchased from the Americans.

This is one of those troublesome mysteries that leave frustration. I had hoped to turn something up in the Intelligence files in London but nothing useful appeared. The French sloop of war JENA, for example, is referred to as having been built as a privateer by an American in France but no name and date; she was taken by the R.N. in 1808 "a mere shell of a vessel" but no plan of this one. I think James found this reference for he repeats it in part in the exact wording. I did not find a reference in the mss. lists of the R.N. Such references are totally useless to me of course.

I would have liked to look up the condemnation papers of some of these ships and of the schooners, for these may help in some cases- I only had time to find four and these gave no useful information concerning the builders. However, I was told that, in some instances, there were data on the builders of French and other prizes. Anyway, this seems to be the one remaining hope.

Had a most interesting time in Turkey and I hope my long report will be published by FAO within the year; it will contain some plans of rowing craft used there, besides plans of modern power fishing boats of the country.

These trips abroad have been profitable in a study of ship design; now I have seen what is available in Denmark, Holland, Britain and Venice; I have also explored the French files as far as is possible. I should like now to see the Swedish plans and what is preserved in Spain.

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FIRST PUBLICATION OF HAIFA MARITIME MUSEUM

Dr. Vernon D. Tate, Chief of the Library at Naval Academy, Annapolis, Maryland, advises that the Haifa Maritime Museum was established about five years ago in order to constitute a research center for the study of maritime science and the history of naviagation in the Mediterranean and the Near East from ancient times to the present day. The Museum has issued its first publication, an oblong pamphlet of some forty pages, reading incidentally from back to front in Western terms, containing photographs of ancient maps and coins, and of models, the latter of recent date for the most part. In all, some thirty models are shown ranging in period from Egyptian through classical, medevial and renaissance to modern times. The text which is minimal is trilingual, Hebrew, French and English. Additional pamphlets are in preparation. The Director is Rav Seren ARIE BEN ELI, and the address is the Maritime Museum, Haifa, Israel.